MRGO Ecosystem Restoration Plan Feasibility Study & EIS

(WRDA 2007 Section 7013)

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Study Background

- MRGO was authorized by Congress in 1956 as Federal navigation channel to provide a shorter route between the Port of New Orleans and the Gulf of Mexico.

- In 2006, Congress directed the Secretary of the Army, through the Chief of Engineers, to develop a plan for de-authorization of deep-draft navigation on the MRGO.

- In June 2008, USACE/ASA(CW) transmitted the MRGO Deep Draft De-authorization Report to Congress, officially de-authorizing the MRGO from the Gulf Intracoastal Waterway (GIWW) to the Gulf of Mexico.

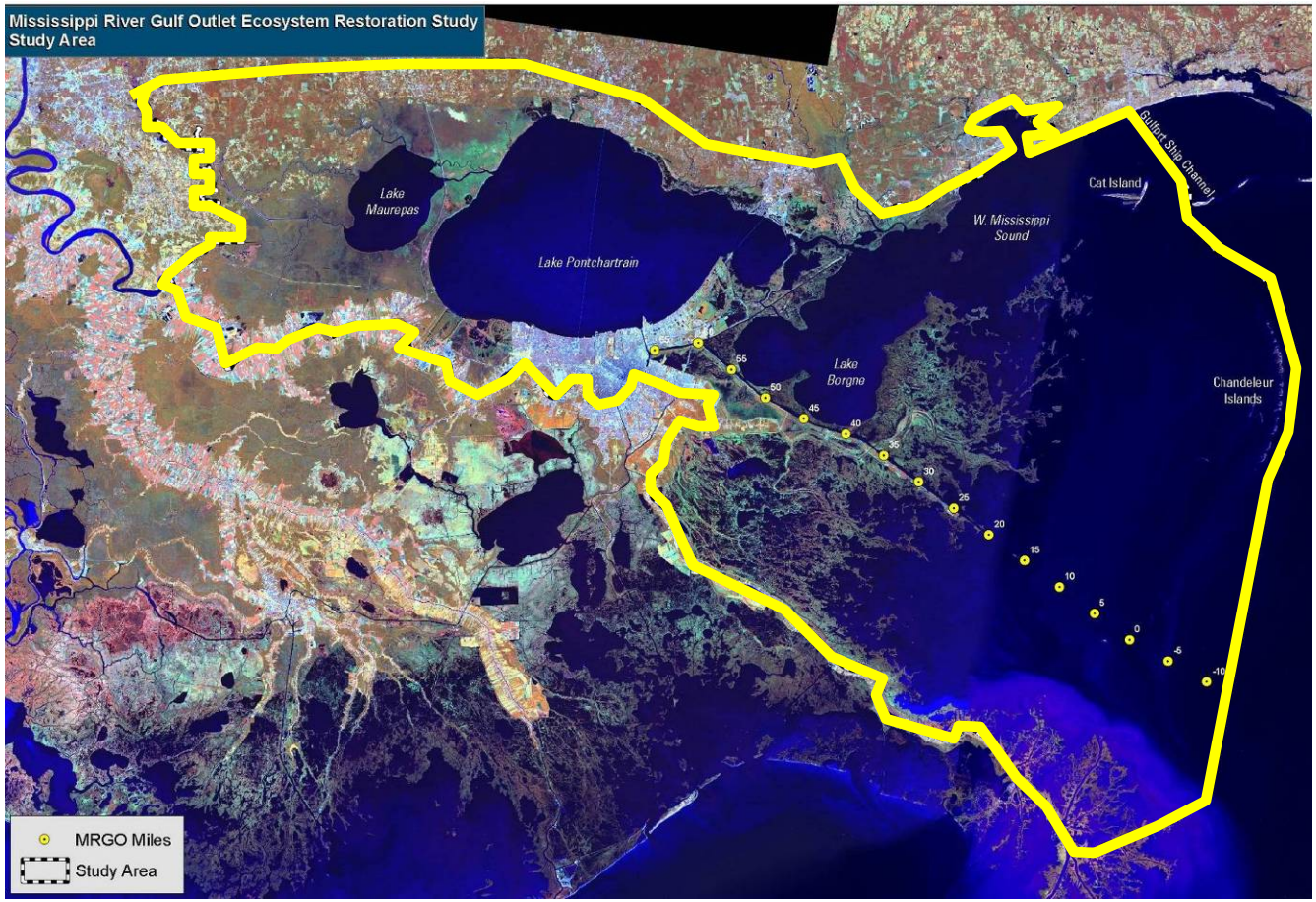
Authority

WRDA 2007 Section 7013 (P.L. 110-114 effective Nov. 8, 2007)

INCLUSIONS — At a minimum, the report … shall include—

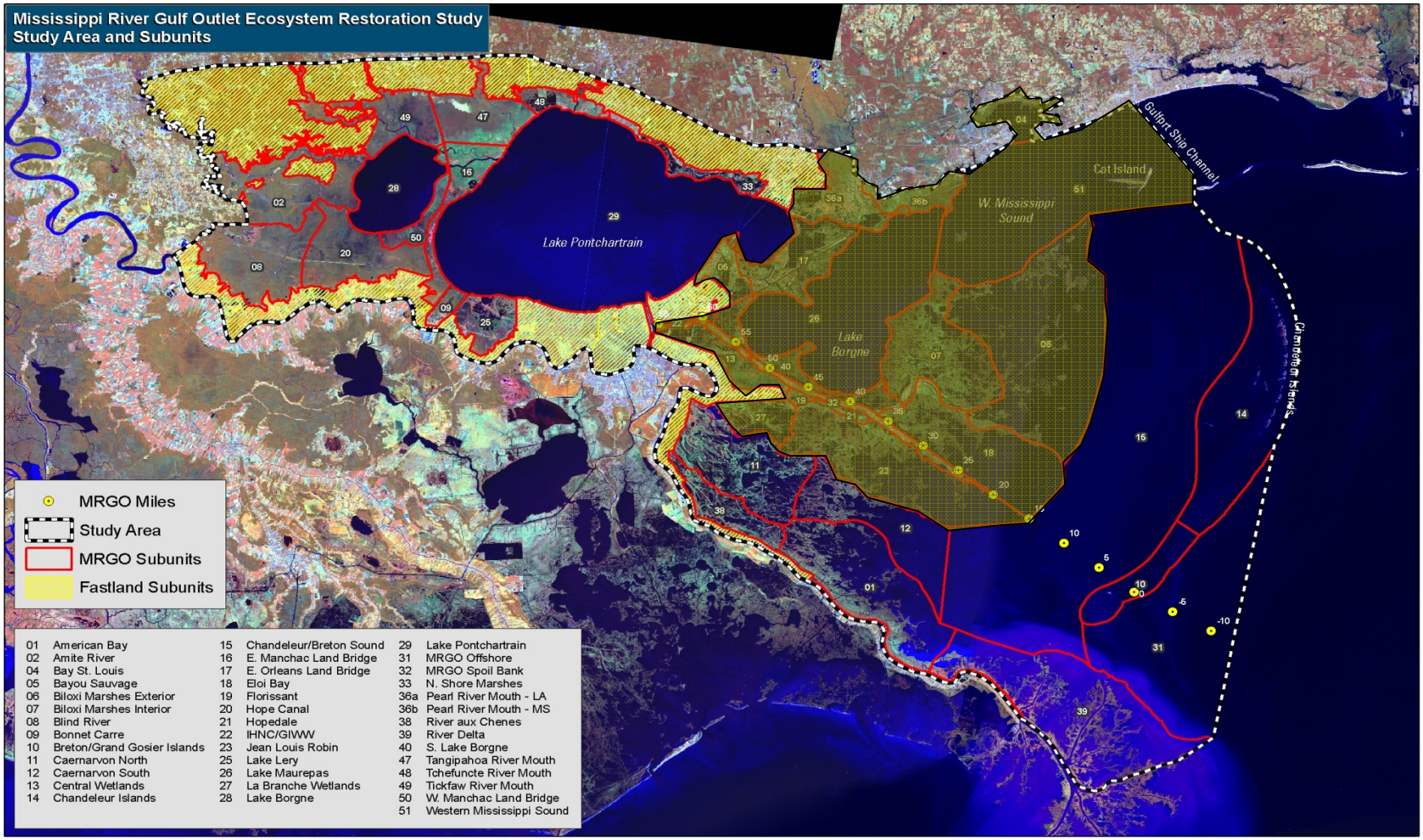
- **a plan to physically modify the Mississippi River-Gulf Outlet and restore the areas affected by the navigation channel;**
- **a plan to restore natural features of the ecosystem that will reduce or prevent damage from storm surge;**
- **a plan to prevent the intrusion of saltwater into the waterway;**
- **efforts to integrate the recommendations of the report with the [LCA] …and the [LACPR] analysis and design …; and**
- **consideration of—**
  - **use of native vegetation; and**
  - **diversions of fresh water to restore the Lake Borgne ecosystem.**

Study Area

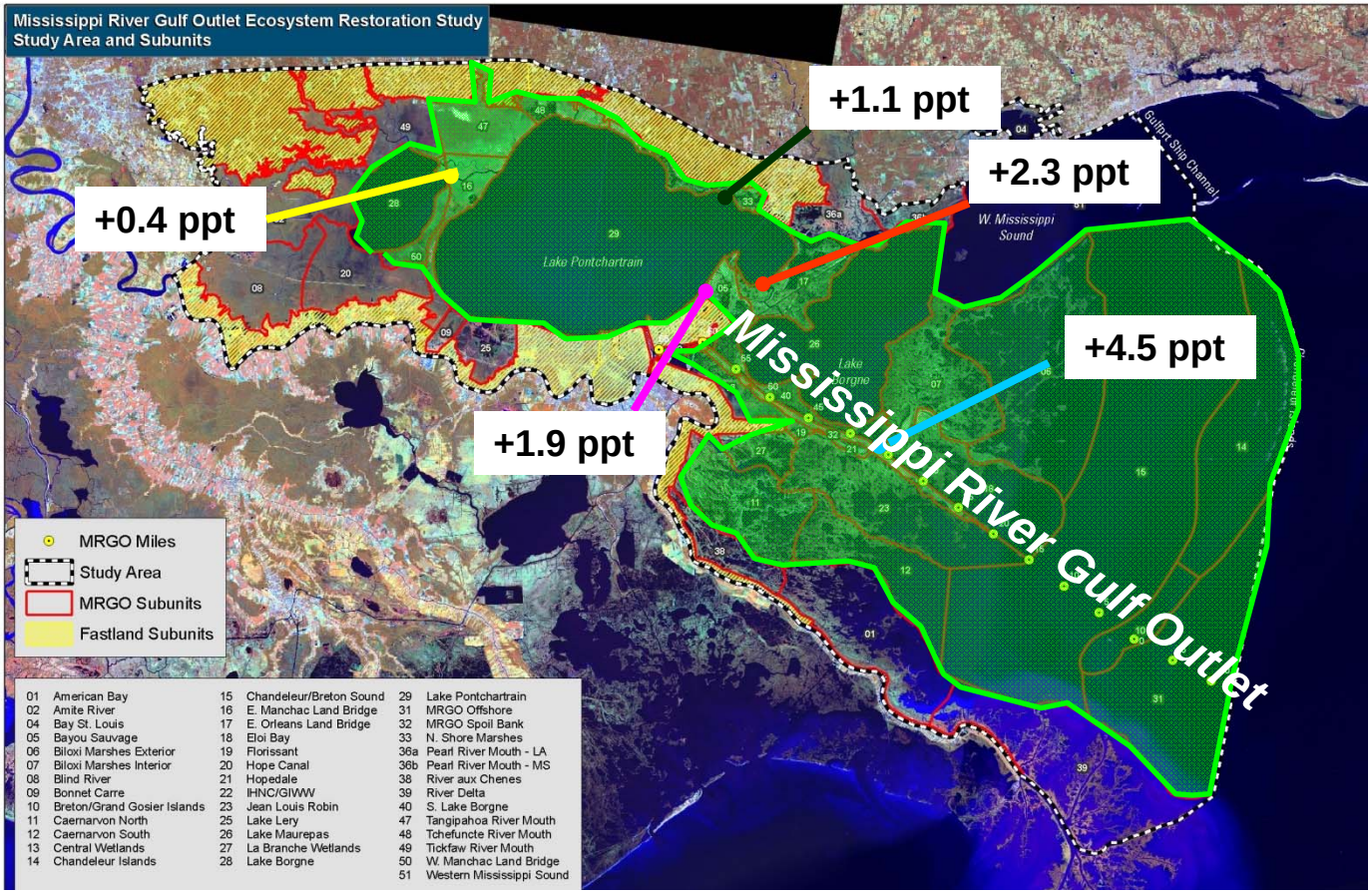


- **Areas affected by the MRGO navigation channel + Lake Borgne Ecosystem**
- **SE Louisiana and SW Mississippi**

Lake Borgne Ecosystem Subunits



Subunits Potentially Affected by MRGO



Average Salinity Increases Post 1963

- **Pass Manchac**
- **North Shore**
- **Little Woods**
- **Chef Menteur Pass**
- **Bayou La Loutre**

Study Purpose and Scope

- Produce Feasibility Study and EIS to support construction
- Develop Comprehensive Ecosystem Restoration Plan for the Lake Borgne ecosystem and areas affected by MRGO
- Measures to reduce or prevent damage from storm surge
- Fully address WRDA 2007 Sec. 7013 through supplement to MRGO Deep-Draft De-Authorization Report

Study Planning Approach

- Collaborative Inter-Agency Team
- Comprehensive Geographic Information System (GIS) of Existing, Authorized and Proposed Projects, Infrastructure, Environmental Resources and Data
- Team Workshops and Seminars
  - LCA and LACPR “Lessons Learned”
  - Cost Effectiveness/Incremental Cost Analysis
  - Hydrodynamic and Water Quality Modeling
- Data-Sharing Website
- Interactive and On-going Public Involvement

Public Involvement To Date

- Early Coordination with Potential Non-Federal Sponsors (States of Louisiana and Mississippi)
- Stakeholder Office Visits
- NEPA Public Scoping Meetings
- Central Wetlands Restoration Planning Forum
- Public Website

Study Area Problems

The MRGO Ecosystem Restoration Plan Feasibility Study will address the following problems:

- Decreased fresh water, sediment and nutrient inputs
- Hydrologic modifications
- Saltwater intrusion
- Wetland loss
- Ridge habitat degradation and destruction
- Bank and shoreline erosion
- Altered circulation and water quality
- Habitat change and land loss
- Invasive species
- Retreating and eroding barrier islands

Study Goals

- Restore the Lake Borgne ecosystem and the areas affected by the MRGO navigation channel.
- Restore natural features of the ecosystem that will reduce or prevent damage from storm surge.
- Achieve ecosystem sustainability to the greatest degree possible.

Existing Conditions

- Channels and canals have altered hydrology
- Saltwater intrusion has resulted in habitat switching
- Mississippi River levees have eliminated the periodic floods that provided freshwater, sediment and nutrients
- Relative sea level rise, tropical storms, shoreline erosion, and other factors contribute to land loss
- Majority of the study area is classified as Essential Fish Habitat (EFH)
- Study area includes critical habitat for threatened Gulf Sturgeon

Management Measures Evaluated

The MRGO Ecosystem Restoration Plan Feasibility Study is evaluating the following types of management measures:

- **Freshwater, sediment, and nutrient introduction**
- **Wetland restoration and creation**
- **Shoreline protection**
- **Bank stabilization**
- **Ridge protection and restoration**
- **Barrier island restoration**
- **Water control (gates, weirs, sills, plugs, fill areas, etc.)**
- **Hydrologic restoration**
- **Use of native vegetation**
- **Modifications to authorized projects**

Initial Screening Results

Management Measure Type	Measures Initially Evaluated	Measures Carried Forward
Riverine Diversions	43	**8**
Hydrologic Restoration		
- Filling	24	**15**
- Water Control Structures	26	**4**
Marsh Creation Using Dredged Material	56	**49**
Shore Protection	56	**43**
Restoration/Creation of Forested Habitat		
- Vegetative Planting	11	**7**
- Swamp Restoration/Creation	5	**5**
Ridge Restoration	55	**16**
Barrier Island Restoration	3	**1**
SAV Pilot Projects	2	**2**
Artificial Oyster Reefs in the Biloxi Marshes	1	**0**
Coastal Mississippi Ecosystem Restoration	1	**1**
TOTAL	**283**	**151**

Initial Array of Alternative Plan Strategies

- No action
- Restoration to pre-Mississippi River and Tributaries (1928) conditions
- Restoration to pre-MRGO conditions
- Maintenance of the existing quantity and quality of wetlands in the entire study area
- Enhancement of the quantity and quality of wetlands in the study area beyond the existing condition
- Restoration of habitats affected by the construction of the MRGO navigation channel
- Maintenance of the existing acreage of wetlands in planning units adjacent to MRGO and Lake Borgne

Initial Array of Alternative Plan Strategies

Restoration to pre-Mississippi River and Tributaries (1928) Conditions

SCREENED OUT DUE TO STUDY CONSTRAINTS

- Human constraints: land development, flood protection projects, and the presence of public infrastructure and travel corridors.
- The physical processes that formed the marsh have changed, e.g. sediment loads in the Mississippi River are lower.
- Recovery through the restoration of key natural processes may require decades or even centuries to fully realize benefits at significant costs.

Initial Array of Alternative Plan Strategies

Restoration to Pre-MRGO Conditions

SCREENED OUT DUE TO STUDY CONSTRAINTS

- It is estimated that it would require approximately 250-350 million cubic yards of dredged material, $2.8 billion, and from 15 to 44 years to fill the channel from mile 60 to mile 25.* Filling the entire channel is not efficient, because the resources required could be used in other ways to produce greater benefits in less time.

- Human constraints, e.g. Lake Pontchartrain and Vicinity project, limit the ability to restore natural processes.

***MRGO LEIS 2008**

Initial Array of Alternative Plan Strategies

Maintenance of the Existing Quantity and Quality of the Wetlands in the Entire Study Area

SCREENED OUT AS INFEASIBLE

– The Pontchartrain Basin is predicted to lose approximately 103,000 acres by 2060 assuming existing relative sea level rise (RSLR) and 113,000 acres assuming accelerated RSLR.*

– According to the National Research Council of the National Academies and the LACPR study team, sustaining the entire Basin may not be possible.*

– High rates of land loss in the Maurepas Swamp and the Delta contribute to high projected loss rates for the entire study area.*

*** LACPR *Coastal Restoration Appendix* (USACE 2009) and *Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana* (National Research Council of the National Academies 2006)**

Initial Array of Alternative Plan Strategies (continued)

Enhancement of the Existing Quantity and Quality of the Wetlands in the Study Area

SCREENED OUT AS INFEASIBLE

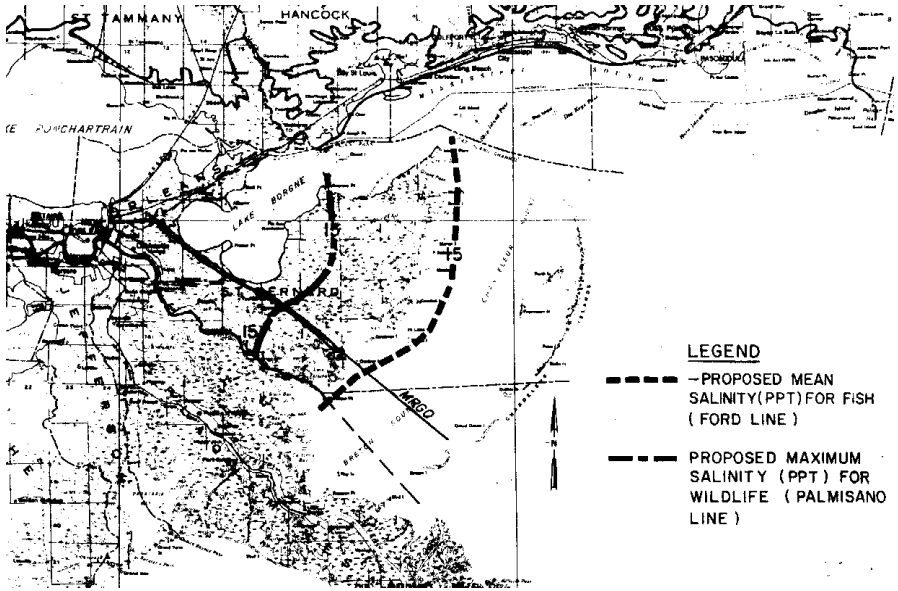
As maintaining the existing quantity and quality of the wetlands in the study area was determined to be infeasible, this alternative plan strategy, which goes beyond maintenance, was also determined to be infeasible.

Alternative Plan Strategies Carried Forward for Further Consideration

- **No action (Plan Strategy A)**
- **Restoration of Habitats affected by the Construction of the MRGO (Plan Strategy B)**
- **Maintenance of Existing Acreage of Wetlands in Planning Units Adjacent to MRGO and Lake Borgne (Plan Strategy C)**

Salinity Targets for All Plan Strategies

On 20 April 2009 the Salinity Working Group validated the use of the 1984 Bonnet Carrè Study targets for the MRGO Ecosystem Restoration Plan



Month	Mean Optimal Salinity (ppt)	Standard Error (ppt)
January	16.4	1.04
February	14.4	0.79
March	11.6	1.02
April	8.0	1.27
May	7.0	0.92
June	12.5	0.80
July	12.7	0.57
August	15.7	0.80
September	17.0	1.06
October	16.8	0.87
November	16.1	0.82
December	15.7	0.52

Habitats Affected by MRGO*

DIRECT IMPACTS

Navigation Channel and Spoil Bank

- **3,400 acres of fresh and intermediate marsh**
- **10,300 acres of brackish marsh**
- **4,200 acres of saline marsh**
- **1,500 acres of cypress swamp and forested wetlands**
- **4,800 acres of shallow open water converted to deep water or disposal**

INDIRECT IMPACTS

- **3,350 acres of fresh and intermediate marsh to brackish marsh**
- **8,000 acres of cypress swamp to brackish marsh**
- **19,170 acres of brackish marsh and swamp to saline marsh**
- **3,400 acres of adjacent marsh lost due to increased tides and salinity**

*** 1956 to 1990. From *Habitat Impacts of the Construction of the MRGO* (USACE 1999)**

Restore Habitats Affected by MRGO Plan Strategy B

MINIMUM ALTERNATIVE RESTORATION PLAN STRATEGY TO MEET STUDY AUTHORITY

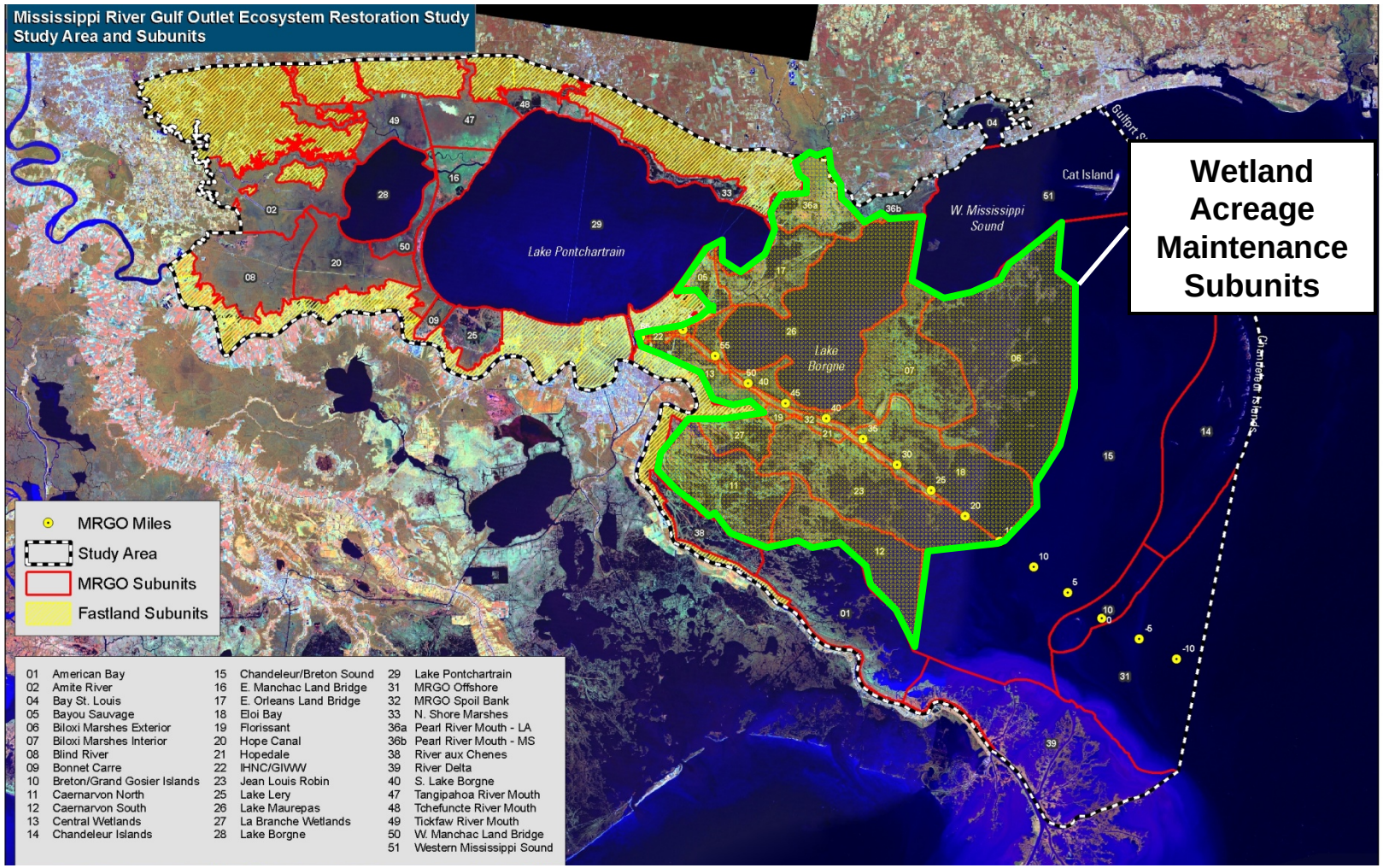
CREATE BUT DO NOT MAINTAIN

- **3,400 acres of fresh and intermediate marsh**
- **10,300 acres of brackish marsh**
- **4,200 acres of saline marsh**
- **1,500 acres of cypress swamp and forested wetlands**
- **3,400 acres of additional marsh adjacent to the channel**

SWITCH

- **3,350 acres of brackish marsh to fresh and intermediate marsh**
- **8,000 acres of brackish marsh to cypress**
- **19,170 acres of saline marsh to brackish marsh and swamp**

Alternative Plan Strategy C



Maintain Existing Acreage of Wetlands in Planning Units Adjacent to MRGO Plan Strategy C

POTENTIAL MAXIMUM FEASIBLE ALTERNATIVE RESTORATION PLAN STRATEGY

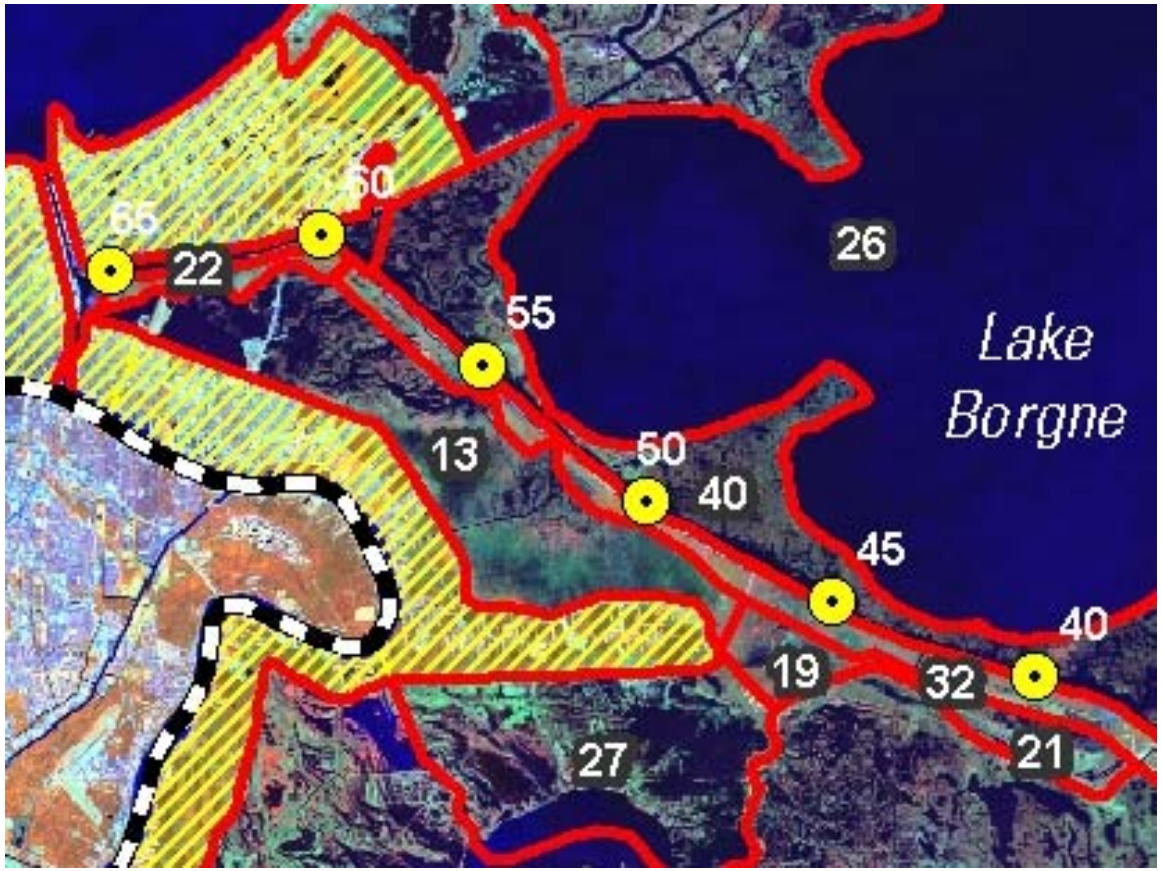
- **Includes the creation of habitat type acreage for Plan Strategy B.**

- **Maintain existing wetland acreage in identified subunits through the period of analysis.**

Future Evaluation of Alternative Plans

- Characterize beneficial and adverse effects of alternative plans by magnitude, location, timing & duration.
- Both costs and ecological benefits will be calculated as average annual values.
- Conduct Cost Effectiveness and Incremental Cost Analysis (CE/ICA).
- Identify the National Ecosystem Restoration (NER) Plan.
- Complete NEPA Compliance Review

Planning Subunit 13 Central Wetlands



1956

Total Land – 20,090 acres

Total Water – 1,925 acres

2006

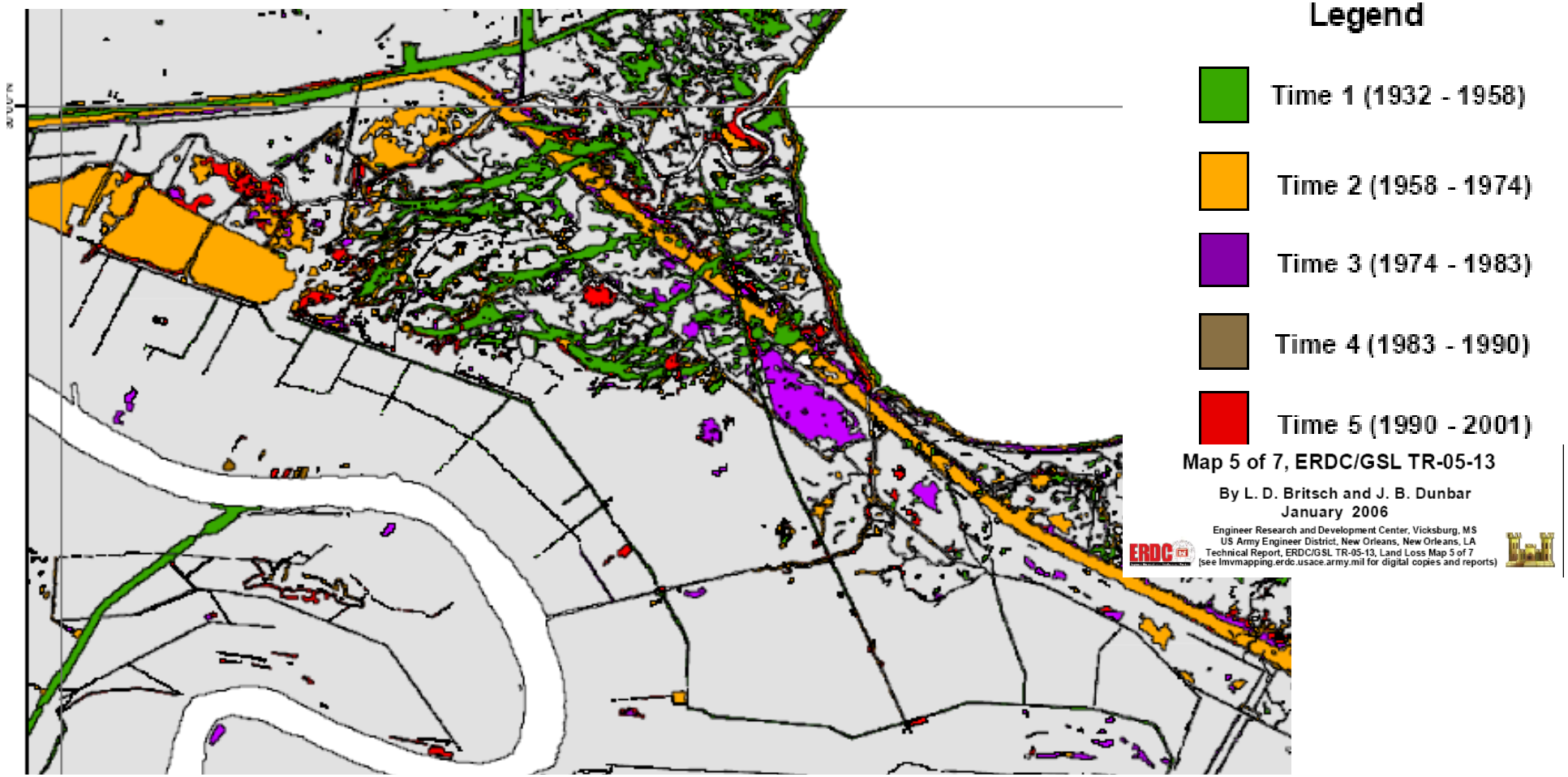
Total Land – 16,108 acres

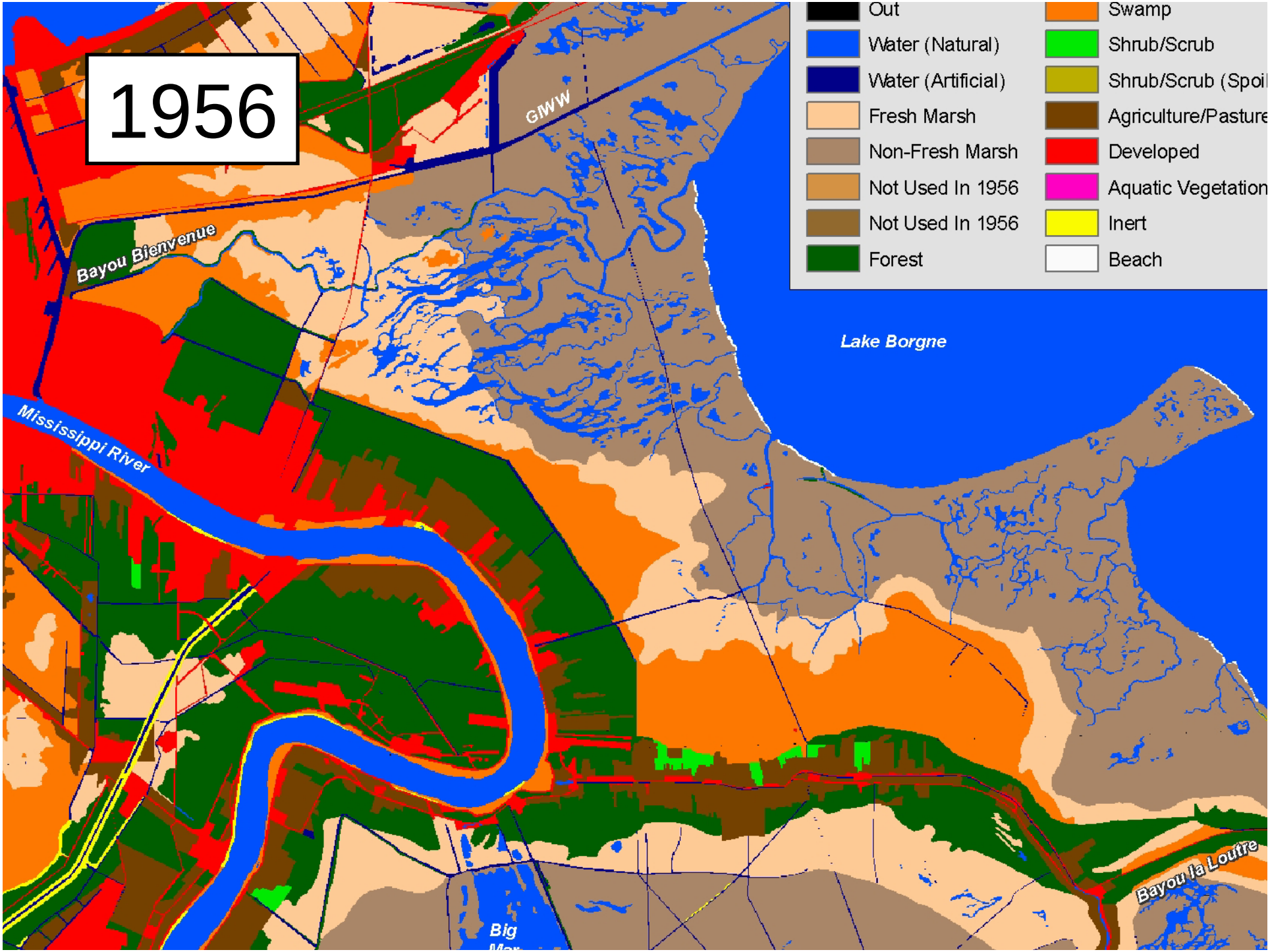
Total Water – 6,717 acres

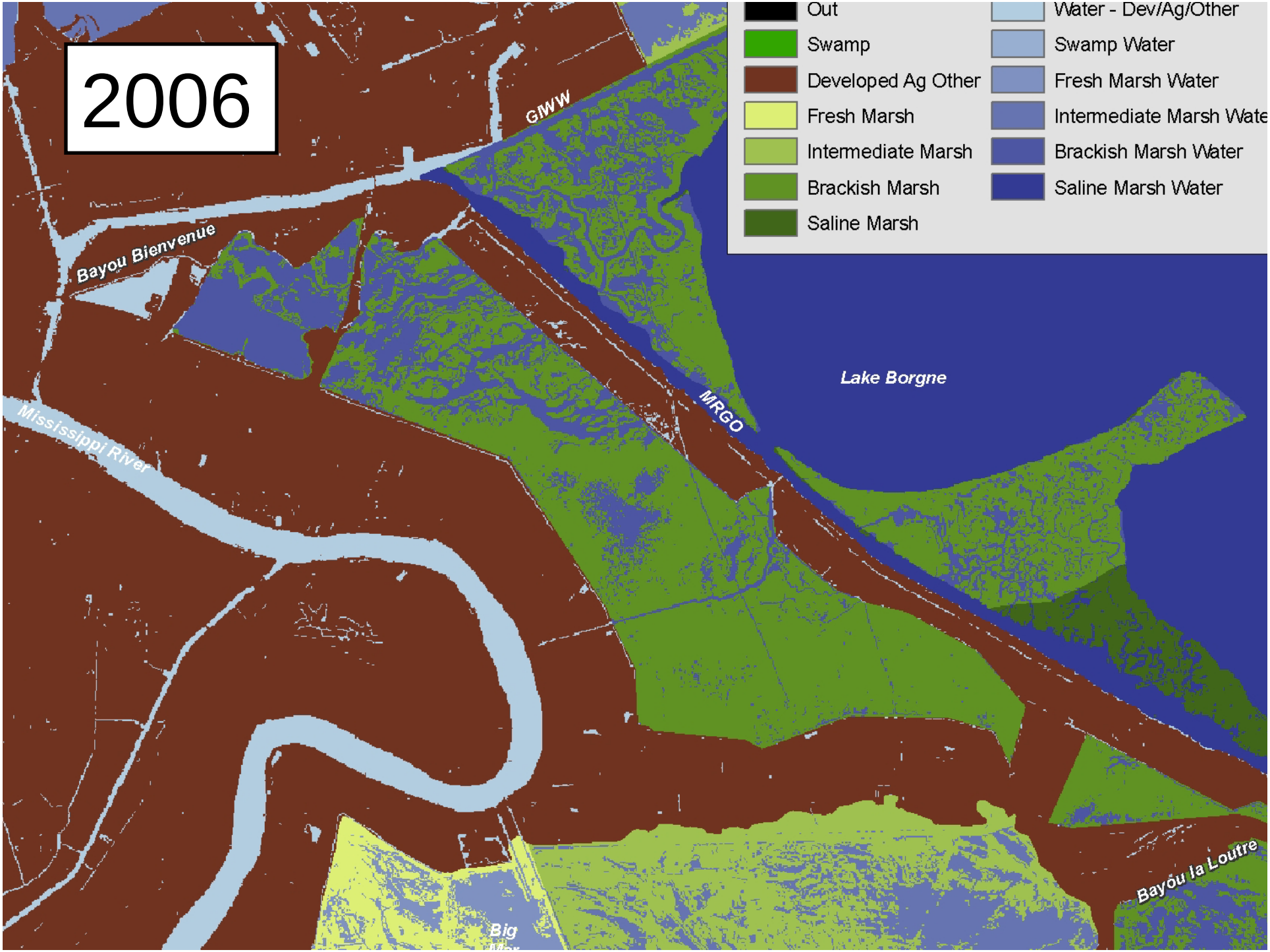
Subunit Problems

- Land loss
- Saltwater intrusion
- Habitat changes
- Water quality issues
- Subsidence
- Lack of nutrients in soils
- Changes to natural hydrology (MRGO, Paris Road, old logging canal spoil banks)
- Hazardous, toxic, and radio-active waste and materials
- Nutria and invasive plant species
- Paris Road flooding concerns
- Land rights issues / lack of clear titles in Orleans Parish portion
- The area is largely impounded
- Hazards in the area (sunken boats, debris and pipelines)
- Tropical storm events

Central Wetlands Land Loss 1932-2001




1956
GIWW
Bayou Bienvenue
Mississippi River
Lake Borgne
Bayou la Loutre
Big
Out
Water (Natural)
Water (Artificial)
Fresh Marsh
Non-Fresh Marsh
Not Used In 1956
Not Used In 1956
Forest
Swamp
Shrub/Scrub
Shrub/Scrub (Spoil
Agriculture/Pasture
Developed
Aquatic Vegetation
Inert
Beach


2006
Out
Swamp
Developed Ag Other
Fresh Marsh
Intermediate Marsh
Brackish Marsh
Saline Marsh
Water - Dev/Ag/Other
Swamp Water
Fresh Marsh Water
Intermediate Marsh Wate
Brackish Marsh Water
Saline Marsh Water
GIWW
Bayou Bienvenue
Mississippi River
MRGO
Lake Borgne
Bayou la Loutre
Big

Subunit Opportunities

TERTIARY TREATMENT OF WASTEWATER THROUGH WETLANDS ASSIMILATION AND/OR FRESHWATER DIVERSION

RELATED PROBLEMS ADDRESSED

- Saltwater intrusion
- Habitat changes
- Water quality issues
- Lack of nutrients in soils
- Changes to natural hydrology

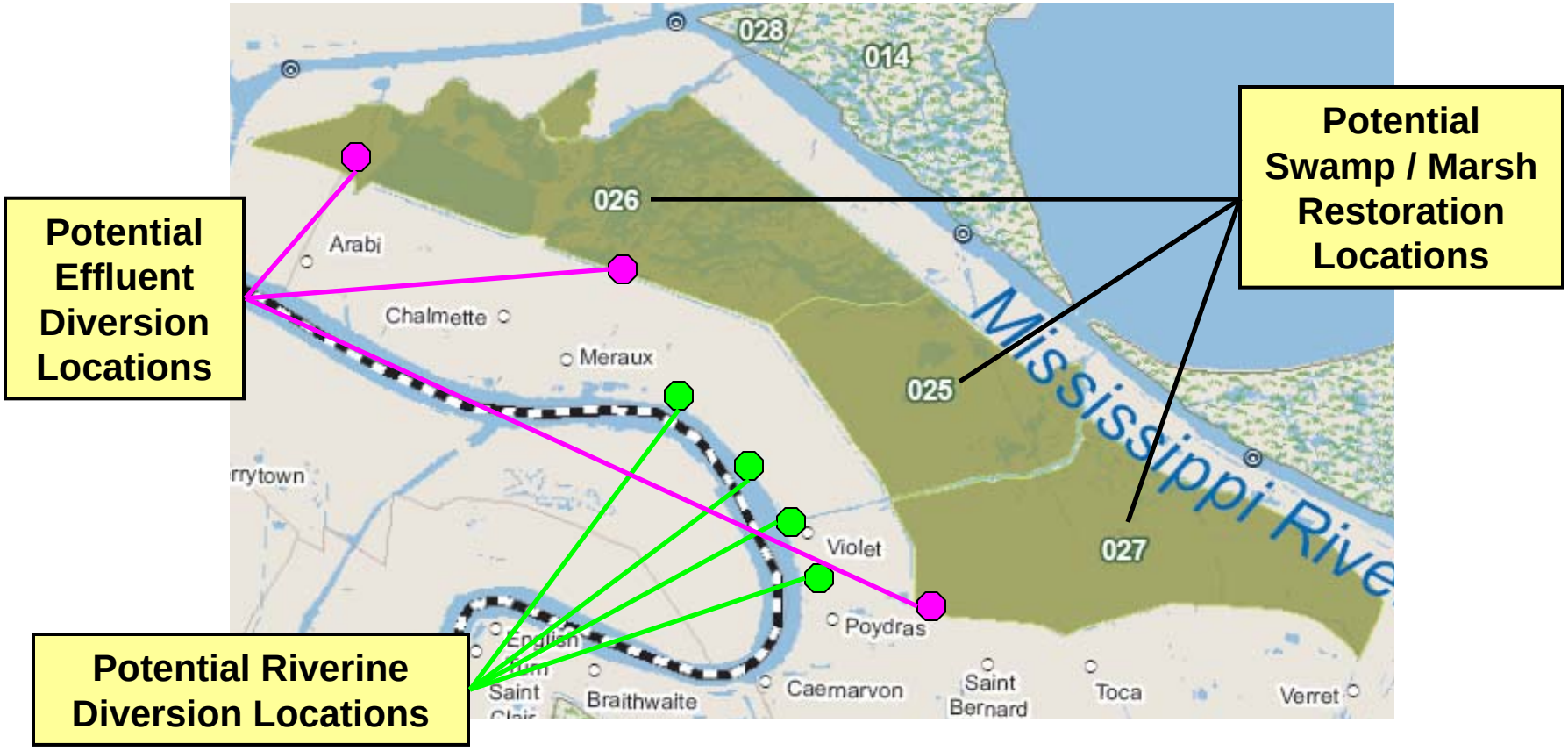
Subunit Opportunities (Continued)

MARSH AND SWAMP CREATION THROUGH PLACEMENT OF FILL AND PLANTING

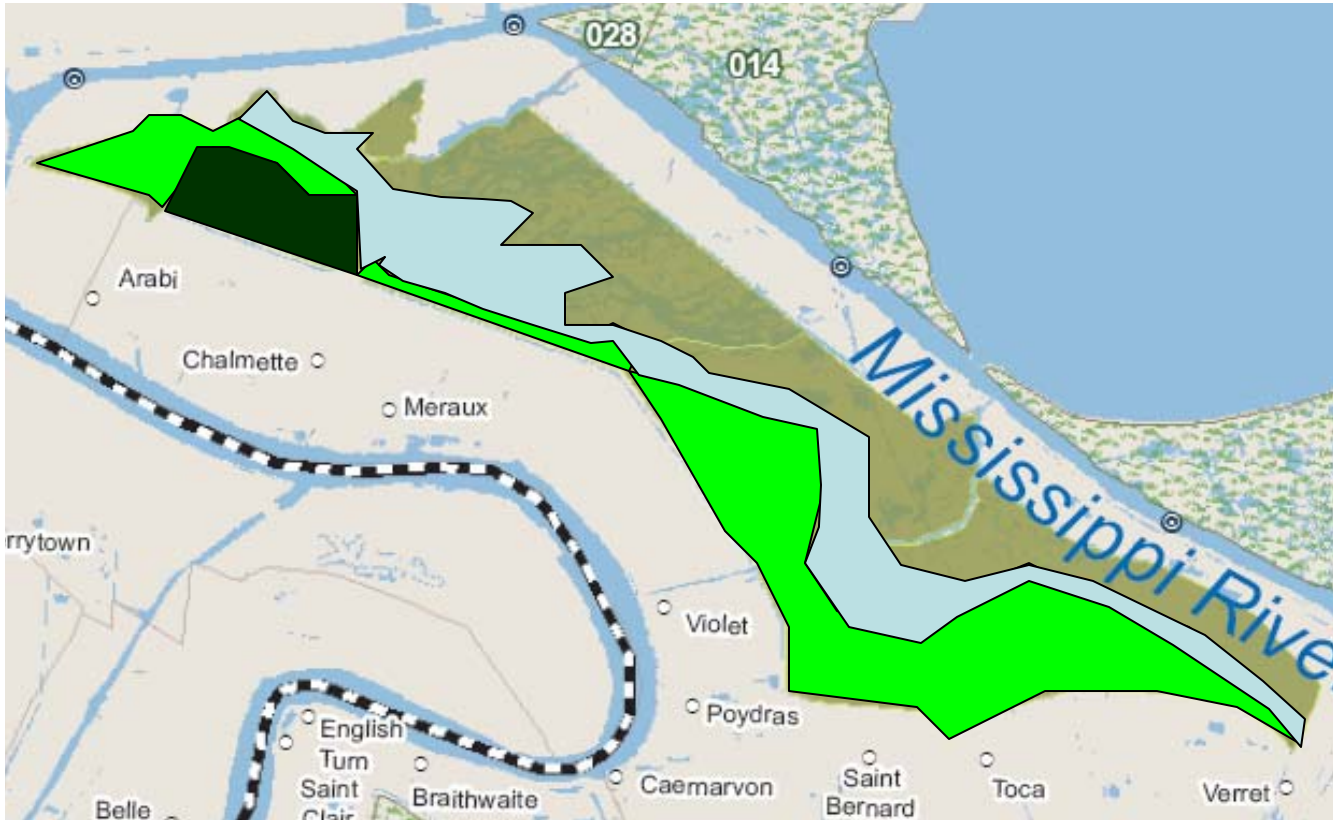
RELATED PROBLEMS ADDRESSED

- Land loss
- Habitat changes
- Water quality issues
- Subsidence
- Lack of nutrients in soils
- Storm damage risk reduction

Potential Central Wetlands Restoration Measures



Central Wetlands Swamp / Marsh Restoration Based on 1956 Habitat Types



- Forest
- Swamp
- Fresh Marsh
- Intermediate / Brackish Marsh

Open Water Areas Present in 1956 Maintained

Upcoming Milestones

– Evaluate & Compare Final Array	Sep-09
– Choose Tentatively Selected Plan	Oct-09
– Technical Review	Nov-09
– Alternative Formulation Briefing	Dec-09
– Complete Eng & Design of TSP	Jan-09
– Cost Estimates Complete for TSP	Feb-09
– Draft Report/EIS Complete	Feb-10
– Complete ATR on Draft Report	Mar-10
– Submit Draft Report (MVN to HQ)	Mar-10

Public Comment Period following release of Draft Report

Additional Information on the Web

History
Fact sheets
Reports
Photos
Document Library

GIS Map Viewer
Public Meeting Info
Presentations
Project Video
Interactive Comment Button

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Questions?